User Guide

HDMI®

HDMI DA4 and HDMI DA6

Distribution Amplifiers

Extron® Electronics
INTERFACING, SWITCHING AND CONTROL

68-1844-02 Rev. A
07 13

Safety Instructions

Safety Instructions • English

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ATTENTION: This symbol, ⚠, when used on the product, is intended to alert the user of important operating and maintenance (servicing) instructions in the literature provided with the equipment.

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Korean

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Conventions Used in this Guide

Notifications

ATTENTION: Attention indicates a situation that may damage or destroy the product or associated equipment.

NOTE: A note draws attention to important information.

TIP: A tip provides a suggestion to make working with the application easier.

Software Commands

Commands are written in the fonts shown here:

```
^AR Merge Scene,,Op1 scene 1,1 ^B 51 ^W^C
[Ø1] R ØØØ4 ØØ3ØØ ØØ4ØØ ØØ8ØØ ØØ6ØØ [Ø2] 35 [17] [Ø3]
Esc X1 * X17 * X20 * X23 * X21 CE ←
```

NOTE: For commands and examples of computer or device responses mentioned in this guide, the character "Ø" is used for the number zero and "O" represents the capital letter "o."

Computer responses and **directory paths** that do not have variables are written in the font shown here:

```
Reply from 2Ø8.132.18Ø.48: bytes=32 times=2ms TTL=32
C:\Program Files\Extron
```

Variables are written in slanted form as shown here:

```
ping xxx.xxx.xxx.xxx –t
SOH R Data STX Command ETB ETX
```

Selectable items, such as menu names, menu options, buttons, tabs, and field names are written in the font shown here:

From the **File** menu, select **New**.

Click the **OK** button.

Specifications Availability

Product specifications are available on the Extron website, **www.extron.com**.

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Introduction

This guide describes the function, installation, and operation of the HDMI DA4 and HDMI DA6. Unless otherwise stated, the terms “distribution amplifier” or “DA” refer to either of these distribution amplifiers.

This section provides the following information:

- **About the HDMI DA4 and HDMI DA6**
- **Features**
- **Application Diagram**

About the HDMI DA4 and HDMI DA6

These Extron distribution amplifiers distribute one HDMI input signal to four (HDMI DA4) or six (HDMI DA6) simultaneous outputs. Both models are fully High-bandwidth Digital Content Protection (HDCP) compliant.

These distribution amplifiers support data rates up to 6.75 Gbps (2.25 Gbps per color) with up to 12-bit deep color and use the EDID Minder® feature for EDID management.

The automatic output compatibility correction feature scans each output device to ensure that the output signal is compatible with the color depth and format requirements of the device. Each output is adjusted independently.

Features

HDMI signal distribution — These distribution amplifiers accept one HDMI input and provide four (HDMI DA4) or six (HDMI DA6) simultaneous HDMI video and embedded multi-channel digital audio signal outputs. Supported HDMI specification features include data rates up to 6.75 Gbps, Deep Color up to 12-bit, 3D, Lip Sync, and HD lossless audio formats.

Supports high-resolution video — including computer-video to 1920x1200, iHDTV 1080p/60 and 2K.

HDCP compliant

Key Minder — continuously verifies HDCP compliance. Key Minder authenticates and maintains continuous HDCP encryption between all input and output devices to enable simultaneous distribution of a single source signal to multiple displays.

EDID Minder — This feature allows the user to choose from a list of 48 factory-loaded EDID files, to import EDID information from either of the display devices, or to import and save an EDID file from a PC. EDID Minder has two modes of operation that can be selected and configured using SIS commands:

- **Automatic:** EDID from the display connected to output 1 is read and stored at the input automatically (default mode). Use SIS commands to read and store EDID from other outputs.
- **User assigned:** EDID can be manually assigned from the internal factory EDID table, which contains 48 unique EDID files categorized by native resolution and audio support. Additionally, there are four user slots available to store and recall EDID from connected displays.

Automatic input cable equalization — to 50 feet at 1080p/60 with 8-bit color when used with Extron HDMI Pro Series cable. Actively conditions incoming HDMI signals to compensate for signal loss when using long cables, low quality cables, or source devices with poor signal output.

Output Compatibility Correction — The distribution amplifiers monitor the EDID of each connected display to ensure it is compatible with the current input signal. The following adjustments are made for each output independently:

- **Interface format:** If the connected display is DVI and the input signal is HDMI, the signal is reformatted to DVI. If the output is HDMI and the input is DVI, no reformatting is needed because HDMI is backwards compatible with DVI.
- **Video color bit depth:** If the connected output device does not support the color bit depth of the input signal, it is truncated down to the next level that is supported (12-bit > 10-bit > 8-bit). The signal can be forced to always truncate to 8-bit via Simple Instruction Set (SIS) commands, disabling deep color.

Output muting via RS-232 — Provides the capability to mute one or all outputs at any time. This allows content to be viewed on a local monitor prior to appearing on the main presentation display.

Signal Status LEDs for the input and each output — LED indicators for signal presence and HDCP authentication provide real-time feedback and monitoring of key performance parameters. The bi-color EDID LED indicator notifies whether an internal or external EDID is stored.

Easy mounting options — The HDMI DA4 and HDMI DA6 are a half rack wide, 1 U high, and 6 inches deep. They can be conveniently mounted in standard racks or under furniture.

Application Diagram

This diagram shows a typical application for the HDMI DA4.

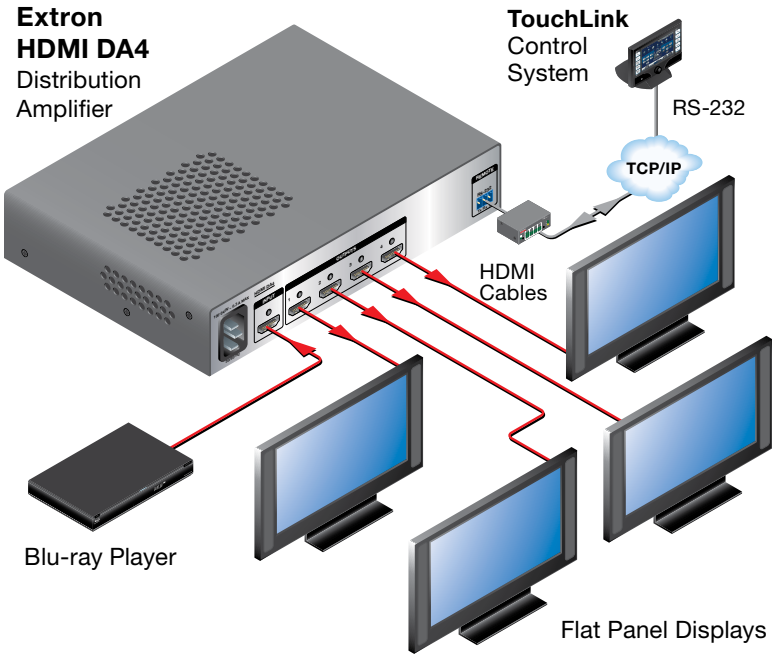


Figure 1. HDMI DA4 Application Diagram

Installation

This section of the guide describes the following topics concerned with the installation and setup of the HDMI DA4 and HDMI DA6 distribution amplifiers.

- **Installation Overview**
- **Rear Panel Features**
- **Connecting Power**
- **Connecting the Input Source**
- **Connecting Output Displays**
- **Wiring for RS-232 Control**
- **Connecting to the USB Port**

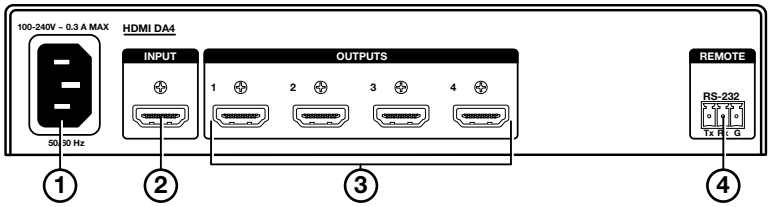
Installation Overview

To install and set up the HDMI DA4 or HDMI DA6, follow these instructions:

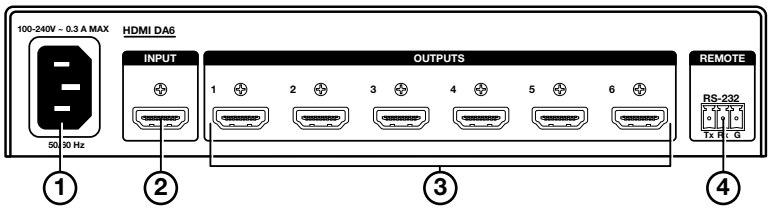
1. **Mount the Distribution Amplifier** in a suitable location (see page 14).
2. **Connect to a 100-240 VAC (50 or 60 Hz) power source** using the provided IEC power cord (see page 4).
3. **Connect the display devices** and power them on (see page 5).

   The distribution amplifier automatically reads and stores EDID from the selected display device. By default, this is the device connected to output 1. For other EDID options, see **EDID Minder** on page 11.
4. If configuration using **SIS commands** is required (see page 15), connect a control PC to the **rear panel captive screw connector** (see page 6) or the **front panel USB port** (see page 7).
5. Connect and power on the **input device** (see page 5).

Rear Panel Features



HDMI DA4



HDMI DA6

Figure 2. HDMI DA4 (above) and HDMI DA6 (below) Rear Panels

① IEC connector

② HDMI input connector

③ HDMI output connectors

④ RS-232 connectors

Connecting Power

Use the provided female IEC cable to connect the female IEC connector to a 100-240 VAC (50 or 60 Hz) power source.

Connecting the Input Source

Use a HDMI cable to connect the input source to the female HDMI socket on the rear panel (② in figure 2).

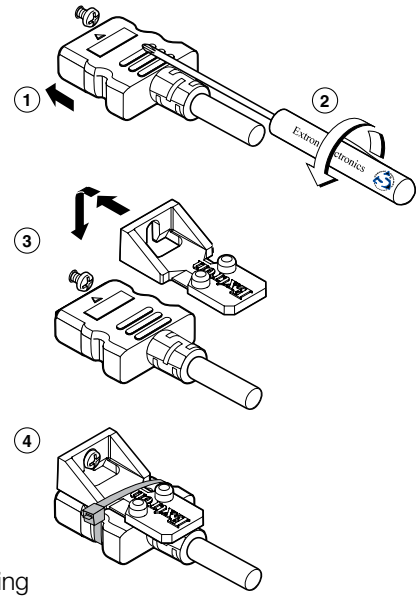
The connectors are fully HDCP compliant. With cables up to 25 feet (7.6 m) they support resolutions of up to 1080p @ 60 Hz with 12-bit color. With cables up to 50 feet (15.2 m) they support 1080p or 1920x1200 @ 60 Hz with 8-bit color.

Follow these instructions to secure the input and output HDMI connectors to the unit with the LockIt™ HDMI lacing bracket provided:

1. Plug the HDMI cable into the panel connection.
2. Loosen the HDMI connection mounting screw from the panel enough to allow the LockIt lacing bracket to be placed over it. The screw does not have to be removed.
3. Place the LockIt lacing bracket on the screw and against the HDMI connector, then tighten the screw to secure the bracket.

   ATTENTION: Do not overtighten the HDMI connection mounting screw. The shield it fastens to is very thin and can easily be stripped.

4. Loosely place the included tie wrap around the HDMI connector and the LockIt lacing bracket as shown.
5. While holding the connector securely against the lacing bracket, tighten the tie wrap, then remove any excess length.



Connecting the Output Displays

Use a HDMI cable to connect up to four (HDMI DA4) or six (HDMI DA6) output displays to the female HDMI sockets on the rear panel (③ in **figure 2** on page 4).

NOTE: Secure the input and output HDMI connectors to the distribution amplifier with the provided LockIt™ HDMI lacing bracket (see **Connecting the Input Source** above).

Connect the primary display to output 1 since, by default, EDID from output 1 is read and stored automatically. 48 factory loaded EDIDs are available. Alternatively, you may store and use EDID from one of the other display devices connected to the distribution amplifier. For more information, see EDID Minder on page 11 or SIS Commands on page 15.

The HDMI DA4 and HDMI DA6 monitor the EDID of each connected display to ensure they are compatible with the current input signal. If necessary, the following adjustments are made for each output independently:

- **Interface format:** If the connected display is DVI and the input signal is HDMI, the signal is reformatted to DVI. If the output is HDMI and the input is DVI, no reformatting is needed because HDMI is backwards compatible with DVI.
- **Video color bit depth:** If the connected output device does not support the color bit depth of the input signal, it is truncated down to the next level that is supported (12-bit > 10-bit > 8-bit). The signal can be forced to always truncate to 8-bit via SIS commands, disabling deep color.

All outputs carry +5 VDC and up to 250 mA on pin 18, regulated by a current limiting circuit.

Wiring for RS-232 Control (Optional)

RS-232 communication between the distibution amplifier and a host PC can be used to update firmware or configure the unit using SIS commands (see "**Command and Response Table for SIS Commands**" on page 17).

The computer connects to either the rear panel 3-pole RS-232 port (④ in **figure 2** on page 3) or the front panel USB port (② in **figure 7** on page 9) of the distribution amplifier.

NOTES:

- Neither port has precedence and commands from either port are handled in the order they are received.
- Extron recommends that the USB port is used for temporary connections. If a permanent connection is required, the RS-232 port should be used.

1. Connect an RS-232 cable, such as Extron universal control cable (UC 50' or UC100') to the computer, using a female 9-pin D connector (see figure 3):
   - Data received by the computer = pin 2
   - Data transmitted by the computer = pin 3
   - Ground = pin 5
2. Wire the opposite end of the cable to the provided 3-pole captive screw plug (see figure 3):
   - Data transmitted by the DA plugs into the Tx (transmit) port
   - Data received by the DA plugs into the Rx (receive) port
   - Ground plugs into the G (ground) port

NOTES:

- The wiring in the RS-232 cables crosses over so that the Tx on the distribution amplifier connects to the Rx of the control device and vice versa. Ground always connects to ground.
- If you use cable that has a drain wire, tie the drain wire to the ground at both ends.

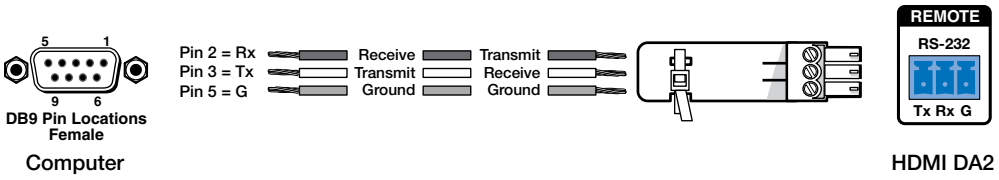


Figure 3. Wiring the HDMI DA4 and HDMI DA6 for RS-232 Control

Connecting to the USB Port

Use the mini Type B USB port on the front panel to connect the distribution amplifier to a host computer to update firmware or to configure the unit with SIS commands.

1. Connect a USB A to mini B cable between the front panel USB Config port and a USB port of the PC.

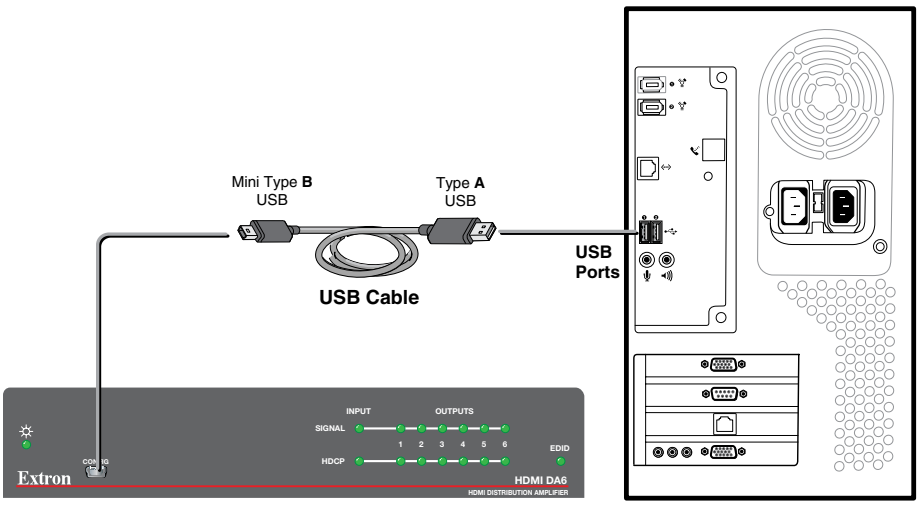


Figure 4. Connecting a PC to the HDMI DA6 Front Panel USB Port

2. If this is the first time a HDMI DA4 or HDMI DA6 is connected to the PC, the Found New Hardware Wizard opens. Connect to Windows Update to search the web for the driver needed for the USB port to communicate with the distribution amplifier. This is not necessary if the USB driver is already on your PC.

Found New Hardware Wizard
Welcome to the Found New Hardware Wizard
Windows will search for current and updated software by looking on your computer, on the hardware installation CD, or on the Windows Update Web site (with your permission).
Read our privacy policy
Can Windows connect to Windows Update to search for software?
Yes, this time only
Yes, now and every time I connect a device
No, not this time
Click Next to continue.
< Back
Next >
Cancel

Figure 5. Found New Hardware Wizard Welcome Screen

- Select **`Yes, this time only`** to connect the PC to Windows Update only this time.
- Select **`Yes, now, and every time I connect a device`** to automatically connect to Windows Update every time the HDMI DA4 or HDMI DA6 connects to this USB port.
- Select **`No, not this time`** if you do not want to connect to Windows Update (for example, if the driver is already on the PC).

3. Click **Next**. The next screen of the Wizard opens:

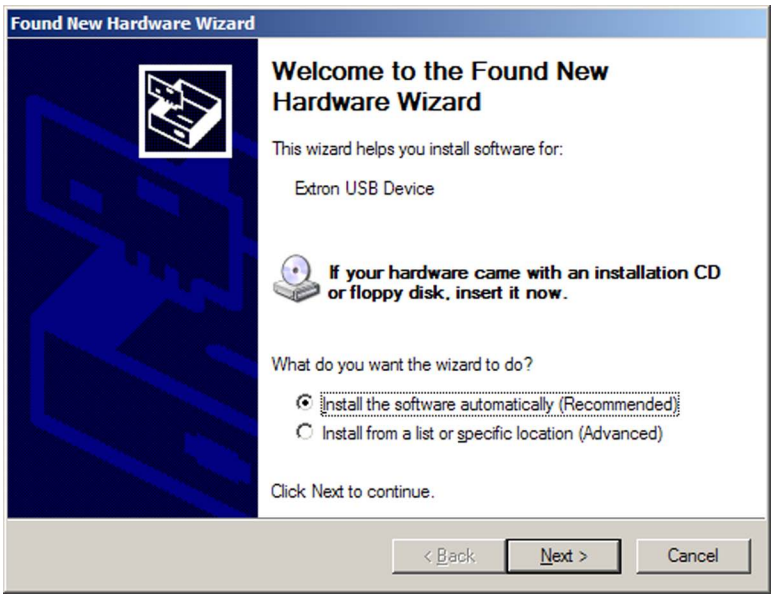

Found New Hardware Wizard
Welcome to the Found New Hardware Wizard
This wizard helps you install software for:
Extron USB Device
If your hardware came with an installation CD or floppy disk, insert it now.
What do you want the wizard to do?
Install the software automatically (Recommended)
Install from a list or specific location (Advanced)
Click Next to continue.
< Back
Next >
Cancel

Figure 6. Installing the Software Automatically

4. Select **Install the software automatically (Recommended)** and click **Next**.

> **NOTE:** You do not need to insert an installation disc.

The PC locates the driver needed and installs it in the correct location on the hard drive.

5. When the Completed screen appears, click **Finish** to close the wizard.

> **NOTE:** The wizard opens only on the first occasion you connect the distribution amplifier to that USB port. The wizard reappears if you connect the unit to a different USB port or if you connect a different piece of equipment, requiring a different driver, to the same USB port.

6. Configure the distribution amplifier as required (see "**Operation**" on page 9).

Operation

This section of the manual provides information on:

- **Front Panel Features**
- **EDID Minder**

Front Panel Features

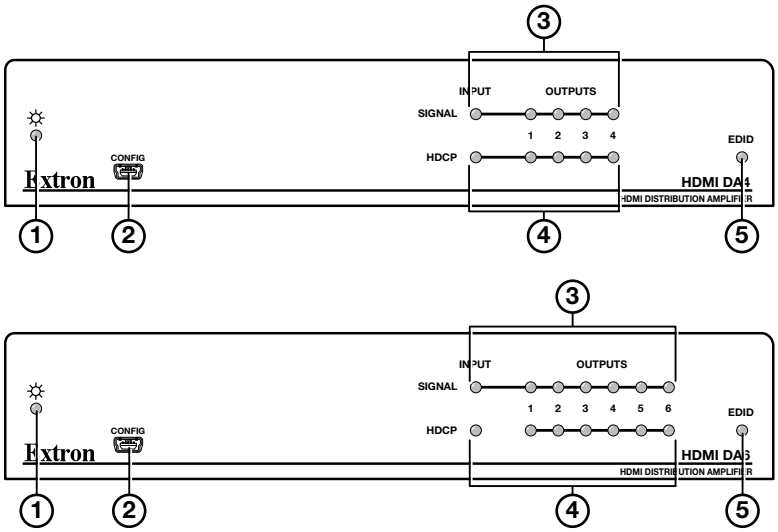


Figure 7. HDMI DA4 (above) and HDMI DA6 (below) Front Panels

① Power status LED

② USB Config port

③ Signal LEDs

④ HDCP LEDs

⑤ EDID LED

Power Status LED

The power status LED lights green when power is applied to the unit.

USB Config Port

The USB Config port is used for SIS configuration, monitoring, and firmware updates. This port can be used as an alternative to the rear panel RS-232 captive screw connectors.

NOTES:

- Neither port has precedence and commands from either port are handled in the order they are received.
- Extron recommends that the USB port is used for temporary connections. If a permanent connection is required, the RS-232 port should be used.

When the USB Config Port is connected to the distribution amplifier for the first time, the Found New Hardware Wizard opens to install the correct device driver (see "**Connecting to the USB Port**" on page 7).

Signal Status LEDs

Input Signal LED

The input signal LED lights green when a TMDS signal is detected on the HDMI input. If the source requires HDCP encryption, this LED may light only after the HDCP has been authenticated.

Output Signal LEDs

There are four (HDMI DA4) or six (HDMI DA6) output signal LEDs, one for each of the outputs. The LEDs light green when an active sink device is connected to the corresponding output.

Input HDCP LED

The Input HDCP LED lights green when the source device requires HDCP encryption and it has been authenticated with the HDMI input.

Output HDCP LEDs

There are four (HDMI DA4) or six (HDMI DA6) output HDCP LEDs, one for each of the outputs. The LEDs light green when HDCP has been authenticated between the HDMI output and the corresponding sink device. This happens when the source device requires HDCP encryption and it has already been authenticated on the HDMI input.

The LEDs do not light if the source does not require HDCP encryption or if the sink is not HDCP compliant.

EDID LED

The EDID LED lights green when the EDID is successfully stored from the selected output device (output 1 by default).

The LED lights amber if the internal, factory-installed EDID is used or if the EDID was not successfully stored.

For information about using the EDID Minder, see “**EDID Minder**” on the following page.

EDID Minder

EDID Minder ensures that the connected source sees the EDID of a display, even if a display is not connected. Depending on the EDID mode selected (by SIS command), the EDID of a connected display can be stored automatically, or the user can manually select from the table of factory loaded EDID files. This EDID is stored on an EEPROM located at the HDMI input.

By default, the HDMI DA4 and HDMI DA6 are configured to store EDID from the display connected to output 1 automatically. The unit reverts to this configuration after a factory reset.

Automatic Mode

In automatic mode, the HDMI DA4 or HDMI DA6 automatically read and store EDID from output 1 (a different output can be chosen using SIS commands). This EDID is retained until a different display is connected to output 1 or the unit is power-cycled. If no display is connected to output 1 when the unit is powered on, then the factory default EDID (720p @ 60 Hz, 2-Ch audio) is used.

User Assigned Mode

In user assigned mode, the user can select from 48 factory loaded EDID files, each catagorized by rate type (PC or HDTV), video format (DVI or HDMI), audio type (2-Ch or Multi-Ch), and native resolution. The unit retains this setting after a power cycle.

Additionally, four user-loaded slots are available to save the EDID of any connected display. EDIDs saved to these slots are retained after a power cycle. Upon a factory reset, these EDIDs revert to the factory default (720p @ 60 Hz, 2-Ch audio).

A table showing the factory loaded EDID options is shown on the following page. The EDID memory location is labelled X5 for consistency with the value in the SIS commands.

HDMI DA4 and HDMI DA6 EDID Memory Locations

X5	Native Resolution	Refresh Rate	[1]Rate Type	[2]Video Format	[3]Audio Type	X5	Native Resolution	Refresh Rate	[1]Rate Type	[2]Video Format	[3]Audio Type
1	800x600	60 Hz	PC	DVI	n/a	30	2048x1080	60 Hz	PC	HDMI	2-ch
2	1024x768	60 Hz	PC	DVI	n/a	31	480p	60 Hz	HDTV	HDMI	2-ch
3	1280x720	60 Hz	PC	DVI	n/a	32	576p	50 Hz	HDTV	HDMI	2-ch
4	1280x768	60 Hz	PC	DVI	n/a	33	720p	50 Hz	HDTV	HDMI	2-ch
5	1280x800	60 Hz	PC	DVI	n/a	34	720p	60 Hz	HDTV	HDMI	2-ch
6	1280x1024	60 Hz	PC	DVI	n/a	35	1080i	50 Hz	HDTV	HDMI	2-ch
7	1360x768	60 Hz	PC	DVI	n/a	36	1080i	60 Hz	HDTV	HDMI	2-ch
8	1366x768	60 Hz	PC	DVI	n/a	37	1080p	50/25 Hz	HDTV	HDMI	2-ch
9	1400x1050	60 Hz	PC	DVI	n/a	38	1080p	50 Hz	HDTV	HDMI	2-ch
10	1440x900	60 Hz	PC	DVI	n/a	39	1080p	60/24 Hz	HDTV	HDMI	2-ch
11	1600x900	60 Hz	PC	DVI	n/a	40	1080p	60 Hz	HDTV	HDMI	2-ch
12	1600x1200	60 Hz	PC	DVI	n/a	41	720p	50 Hz	HDTV	HDMI	multi-ch
13	1680x1050	60 Hz	PC	DVI	n/a	42	720p	60 Hz	HDTV	HDMI	multi-ch
14	1920x1080	60 Hz	PC	DVI	n/a	43	1080i	50 Hz	HDTV	HDMI	multi-ch
15	1920x1200	60 Hz	PC	DVI	n/a	44	1080i	60 Hz	HDTV	HDMI	multi-ch
16	2048x1080	60 Hz	PC	DVI	n/a	45	1080p	50/25 Hz	HDTV	HDMI	multi-ch
17	800x600	60 Hz	PC	HDMI	2-ch	46	1080p	50 Hz	HDTV	HDMI	multi-ch
18	1024x768	60 Hz	PC	HDMI	2-ch	47	1080p	60/24 Hz	HDTV	HDMI	multi-ch
19	1280x768	60 Hz	PC	HDMI	2-ch	48	1080p	60 Hz	HDTV	HDMI	multi-ch
20	1280x800	60 Hz	PC	HDMI	2-ch	49	Output 1 (default)				
21	1280x1024	60 Hz	PC	HDMI	2-ch	50	Output 2				
22	1360x768	60 Hz	PC	HDMI	2-ch	51	Output 3				
23	1366x768	60 Hz	PC	HDMI	2-ch	52	Output 4				
24	1400x1050	60 Hz	PC	HDMI	2-ch	53	Output 5	Outputs 5 and 6 are available only on the HDMI DA6			
25	1440x900	60 Hz	PC	HDMI	2-ch	54	Output 6				
26	1600x900	60 Hz	PC	HDMI	2-ch	55	User loaded slot 1				
27	1600x1200	60 Hz	PC	HDMI	2-ch	56	User loaded slot 2				
28	1680x1050	60 Hz	PC	HDMI	2-ch	57	User loaded slot 3				
29	1920x1200	60 Hz	PC	HDMI	2-ch	58	User loaded slot 4				

The HDMI DA4 or DA6 read and store EDID from corresponding output automatically. In **Automatic Mode** (see page 11), the EDID from Output 1 is used, by default.

Table 1. HDMI DA4 and HDMI DA6 EDID Memory Locations ([1,2,3] see footnotes on the following page)

Footnotes for the EDID memory locations table (see page 12)

The following footnotes apply to the EDID table on the previous page:

[1]Rate Type

- PC: These are primarily VESA standard computer rates, based on the most commonly used native resolutions. They are designed to be used with computer sources.
- HDTV: These are video rates standardized by SMPTE and CEA. They are designed to be used with video and computer sources.

[2]Video Format

- DVI: These are 128-byte EDID files, which specify a DVI sink. They do not contain an extension block.
- HDMI: These are 256-byte EDID files, each containing a CEA extension block. They each specify an HDMI sink device with audio support.

[3]Audio Type

- n/a: These are DVI formatted EDID files; therefore, they do not support audio.
- 2-Ch: These are HDMI formatted EDID files, with support for basic 2-channel (stereo) audio.
  - LPCM (2-Ch)
- Multi-Ch: These are HDMI formatted EDID files with support for multiple audio formats, up to 8 channels.
  - LPCM (2-Ch)
  - LPCM (8-Ch)
  - Dolby Digital (6-Ch)
  - DTS (7 Ch)
  - Dolby Digital Plus (8-Ch)
  - DTS-HD (8-Ch)
  - Dolby TrueHD (8-Ch)

Mounting

The HDMI DA unit can be mounted in any of the following locations:

- **Desktop Placement**
- **Rack Mounting**
- **Under-desk Mounting**

Desktop Placement

Attach the four provided rubber feet to the bottom of the unit and place it in any convenient location.

Rack Mounting

UL Guidelines for Rack Mounting

The following Underwriters Laboratories (UL) guidelines are relevant to the safe installation of these products in a rack:

1. **Elevated operating ambient temperature** — If the unit is installed in a closed or multi-unit rack assembly, the operating ambient temperature of the rack environment may be greater than room ambient temperature. Therefore, install the equipment in an environment compatible with the maximum ambient temperature (Tma: +122 °F, +50 °C) specified by Extron.
2. **Reduced air flow** — Install the equipment in the rack so that the equipment gets adequate air flow for safe operation.
3. **Mechanical loading** — Mount the equipment in the rack so that uneven mechanical loading does not create a hazardous condition.
4. **Circuit overloading** — Connect the equipment to the supply circuit and consider the effect that circuit overloading might have on overcurrent protection and supply wiring. Consider the equipment nameplate ratings when addressing this concern.
5. **Reliable earthing (grounding)** — Maintain reliable grounding of rack-mounted equipment. Pay particular attention to supply connections other than direct connections to the branch circuit (such as the use of power strips).

Rack Mounting Procedure

To mount the unit on a rack shelf, follow the instructions provided with the shelf accessories.

Under-desk Mounting

Mount the unit under a desk or podium, using an appropriate mounting kit. Follow the instructions provided with the kit.

SIS Commands

This section provides information about the SIS commands that are used to configure the HDMI DA4 and HDMI DA6. The following topics are discussed:

- **Introduction to SIS**
- **Symbols Used in this Guide**
- **Command and Response Table for SIS Commands**

Introduction to SIS

The distribution amplifiers can be set up and controlled remotely via Extron SIS commands that are issued from a host computer running the Extron DataViewer utility or other control system. The host device can be connected to the 3-pole captive screw connector on the rear panel or to the mini USB Bconfig port on the front panel.

The protocol is 9600 baud, 8 data bit, 1 stop bit, and no parity.

NOTES:

- The wiring in the RS-232 cables crosses over so that the distribution amplifier transmit (Tx) wire connects with the control device receive (Rx) and vice versa.
- Only one control port can be used at a time. If the front port is in use, the rear captive screw connector must be disconnected from the computer or other control device. Likewise, if the captive screw port is in use, the USB port on the front panel must be disconnected from the computer or other control device.

Host-to-Distribution Amplifier Communications

SIS commands consist of strings (one or more characters per command field). No special characters are required to begin or end a command sequence. Unless otherwise stated, upper and lower case characters can be used interchangeably. Most responses from the distribution amplifier ends with a carriage return and a line feed (CR/LF = ↵), which signals the end of the response character string. When the switcher determines that a command is valid, it executes the command and sends a response to the host device.

Distribution Amplifier-initiated Messages

When a local event such as a change in signal status takes place, the distribution amplifier responds by sending a message to the host, indicating the status change. No response is required from the host.

When the distribution amplifier is first switched on, it sends the message:

`(c) Copyright 20yy, Extron Electronics HDMI DA Series, V x.xx, 60-99x-01↵` where `20yy` is the year the currently installed version of the firmware was released, `60-99x-01` is the catalog part number and `V x.xx` is the firmware version number.

NOTE: This response is only seen when the control computer is connected by the rear panel RS-232 control port.

Symbols Used in this Guide

When programming in the field, certain characters are most conveniently represented by their hexadecimal rather than their ASCII values. The table below shows the hexadecimal equivalent of each ASCII character:

ASCII to HEX Conversion Table										Esc	1B	CR	ØD	LF	ØA
Space	2Ø	!	21	"	22	#	23	$	24	%	25	&	26	'	27
(	28	)	29	*	2A	+	2B	,	2C	-	2D	.	2E	/	2F
Ø	3Ø	1	31	2	32	3	33	4	34	5	35	6	36	7	37
8	38	9	39	:	3A	;	3B	<	3C	=	3D	>	3E	?	3F
@	4Ø	A	41	B	42	C	43	D	44	E	45	F	46	G	47
H	48	I	49	J	4A	K	4B	L	4C	M	4D	N	4E	O	4F
P	5Ø	Q	51	R	52	S	53	T	54	U	55	V	56	W	57
X	58	Y	59	Z	5A	[	5B	\	5C	]	5D	^	5E	_	5F
`	6Ø	a	61	b	62	c	63	d	64	e	65	f	66	g	67
h	68	i	69	j	6A	k	6B	l	6C	m	6D	n	6E	o	6F
p	7Ø	q	71	r	72	s	73	t	74	u	75	v	76	w	77
x	78	y	79	z	7A	{	7B	l	7C	}	7D	~	7E	DEL	7F

Table 2. ASCII to HEX Conversion Table

↵ — carriage return with line feed

← — carriage return (no line feed)

• — space character

Esc — Escape key

The Xn values defined in this section are the variables used in the fields of the Command Response Table.

X1 — Output

1, 2, 3, or 4 (HDMI DA4)
1, 2, 3, 4, 5, or 6 (HDMI DA6)

X2 — Video mute status
Ø = disabled
1 = video mute
2 = video and sync mute

X3 — Status
Ø = disabled, off, or undetected
1 = enabled, on, or detected

X4 — Video color bit depth
Ø = auto (based on EDID of sink)
1 = force 8-bit
2 = pass-through

X5 — EDID memory location (see "**HDMI DA4 and HDMI DA6 EDID Memory Locations**" Table on page 12)

X6 — EDID data as 256 bytes of Hex data (text representation)

X7 — Native resolution and refresh rate (translated from Hex)
for example: 1600x1200 @60Hz

X8 — Controller firmware version to the second decimal place

X9 — Unit name: Up to 24 alphanumeric characters (including the hyphen [-])
No spaces are allowed
There is no distinction between upper and lower case letters
The first character must be a letter
The last character cannot be a hyphen (-)

Error Messages

E01 — Invalid output channel number (too large)

E10 — Invalid command

E13 — Invalid value (too large)

Command and Response Table for SIS Commands

Command	ASCII Command (host to unit)	Response (unit to host)	Additional Description
Video Mute			
Video mute single output	X1*X2B	VmtX1*X2↵	Video mute output X1 only 1, 2, 3, or 4 (HDMI DA4) 1, 2, 3, 4, 5, or 6 (HDMI DA6) X2 = 0 (video mute disabled) or 1 (video mute) or 2 (video and sync mute)
Video mute all outputs	X2B	VmtX2↵	Video mute all outputs
Query Video mute status	B	VmtX2•X2•...X2↵	video mute status of outputs 1 to 4 (HDMI DA4) or 1 to 6 (HDMI DA6).
Audio Mute			
Audio mute single output	X1*X3Z	AmtX1*X3↵	Audio mute output X1 only X3 = 0 (audio mute disabled) or 1 (audio mute)
Audio mute all outputs	X3Z	AmtX3↵	Audio mute all outputs
Query Audio mute status	Z	AmtX3•X3•...X3↵	Audio mute status of outputs 1 to 4 (HDMI DA4) or 1 to 6 (HDMI DA6).
Video Color Bit Depth			
Set video bit depth for a specific input	EscVX1*X4BITD←	BitdVX1*X4↵	X4 = 0 (auto, based on sink EDID) 1 (force 8-bit) 2 (pass-through, unmodified)
Set video bit depth for all inputs	EscVX4BITD←	BitdVX4↵	
View video bit depth for all inputs	EscVBITD←	BitdVX4•X4•...X4↵	video bit depth of outputs 1 to 4 (HDMI DA4) or 1 to 6 (HDMI DA6).
Signal Status			
Request all signal status	EscLS←	SigX3*X3•X3•...X3↵	Signal status (X3) of the input and outputs 1 to 4 (HDMI DA4) or 1 to 6 (HDMI DA6) Signal status of input * output 1 • output 2 • output *n* X3 = 0 (signal undetected) or 1 (signal detected)
Request all HDCP status	EscHDCP←	HdcpX3*X3•X3...X3↵	X3 = 0 (HDCP on) or 1 (HDCP off) HDCP status of input * output 1 • output 2 • output *n*

Command	ASCII Command (host to unit)	Response (unit to host)	Additional Description
HDCP Authorized Device			
Enable or disable HDCP authorization	Esc E X3 HDCP ←	HdcpE X3 ↵	X3 = Ø (HDCP authorization enabled) or 1 (HDCP authorization disabled)
Request HDCP authorization status	Esc EHDCP ←	X3 ↵	
EDID Minder			
Assign EDID to input	Esc A X5 EDID ←	EdidA X5 ↵	X5 = EDID memory location (1-58) see the "**HDMI DA4 and HDMI DA6 EDID Memory Locations**" table on page 12
View EDID assignment	Esc AEDID ←	X5 ↵	
Save EDID of output to user location	Esc S X1 * X5 EDID ←	EdidS X1 * X5 ↵	Store the EDID of output X1 into EDID memory location X5 (55-58)
View/Read EDID in Hex	Esc REDID ←	X6 ↵	Read out EDID in Hex from currently selected EDID
View EDID native resolution	Esc NEDID ←	X7 ↵	Resolution and refresh rate of currently selected EDID *Example: 1600x1200@60Hz*
Unit Name			
Set unit name	Esc X9 CN ←	Ipn•X9 ↵	X9 = Up to 24 alphanumeric characters, including "-"
Set unit name to factory default	Esc •CN ←	Ipn•HDMA-DA-SERIES ↵	
View unit name	Esc CN ←	X9 ↵	
Other			
Request part number	N	6Ø-998-Ø1 ↵ 6Ø-999-Ø1 ↵	HDMI DA4 HDMI DA6
Query firmware version	Q	X8 ↵	X8 = Firmware build (2 decimal places)
Reset	Esc ZXXX ←	Zpx ↵	

Updating Firmware

Updates to the HDMI DA Series firmware are released periodically on the Extron website. You can find which version is currently loaded on your distribution amplifier using SIS commands. Compare this with the latest release on the Extron website and decide whether to update your firmware.

TIP: Read the Release Notes provided on the website with the latest firmware to determine whether you need the latest version.

This chapter describes how to update firmware for the HDMI DA4 and HDMI DA6:

- **Downloading and Installing Firmware Loader**
- **Downloading HDMI DA Series Firmware**
- **Loading the Firmware to the Distribution Amplifier**

Downloading and Installing Firmware Loader

Extron recommends using the Firmware Loader software to update the firmware on Extron products. If you do not already have Firmware Loader installed on your computer, download it as follows:

1. Go to the Extron website at **www.extron.com** and click the **Download** tab.
2. On the Download Center screen, click the **Software** link on the left sidebar menu.
3. On the next Download Center screen, locate Firmware Loader and click its **Download** link.

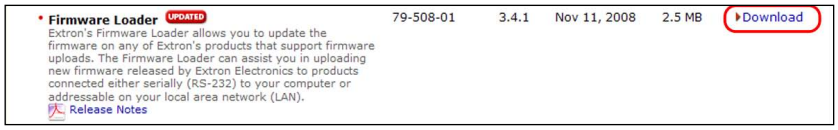

Firmware Loader
UPDATED
Extron's Firmware Loader allows you to update the firmware on any of Extron's products that support firmware uploads. The Firmware Loader can assist you in uploading new firmware released by Extron Electronics to products connected either serially (RS-232) to your computer or addressable on your local area network (LAN).
Release Notes
79-508-01
3.4.1
Nov 11, 2008
2.5 MB
Download

Figure 8. Firmware Loader Download Link

4. On the next screen, enter the requested information, then click the **Download** **fw_loader_vnxnxn.exe** button (where n is the Firmware Loader version number).
5. Follow the instructions on the rest of the download screens to save the executable Firmware Loader installer file to your computer. Note the folder to which the file was saved.
6. In Windows Explorer or another file browser, locate the downloaded executable installer file and double-click it to open it.
7. Follow the instructions on the Installation Wizard screens to install Firmware Loader on your computer. Unless you specify otherwise, the installer program places the Firmware Loader file, FWLoader.exe, at `c:\Program Files\Extron\FWLoader`.

Downloading HDMI DA Series Firmware

To obtain the latest version of firmware for your distribution amplifer:

1. Visit the Extron website (**www.extron.com**), click the **Download** link at the top of the page, then click the **Firmware** link on the left sidebar menu.

Figure 9. Firmware Link on the Download Tab

2. On the Download Center screen, locate the section for the HDMI DA Series firmware
3. (Optional) click **Release Notes**. These notes show the issues that are addressed by the latest update. If these issues do not affect you, you may decide not to upgrade the firmware.
4. Click the **HDMI DA Series Download** link.
5. On the next screen that appears, enter the requested user information, then click the **Download** button.
6. Follow the instructions on the rest of the download screens to save the executable firmware file to your computer. Note the folder to which the file was saved.
7. In Windows Explorer or another file browser, locate the downloaded executable file, and double-click it to open it.
8. Follow the instructions on the Installation Wizard screens to install the new firmware on your computer. A Release Notes file and a set of instructions for updating the firmware are also loaded.

Loading the Firmware to the Distribution Amplifier

To load a new version of firmware to the switcher using Firmware Loader, connect your computer serial port to the first three pins of the switcher Remote port (see "**Wiring for RS-232 Control**" on page 6 for information on connecting to the serial port).

1. If you have not already done so, download and install the Firmware Loader executable installer file to your computer (see "**Downloading and Installing Firmware Loader**" on page 19).
2. If necessary, download the latest version of HDMI DA Series firmware and install it on your computer (see "Downloading the HDMI DA Series Firmware" on the previous page).
3. Open the Firmware Loader via your desktop **Start** menu by making the following selections:

   `Start` > `All Programs` > `Extron Electronics` > `Firmware Loader` > `Firmware Loader`

   The Firmware Loader dialog box opens with the Add Device dialog in front of it.

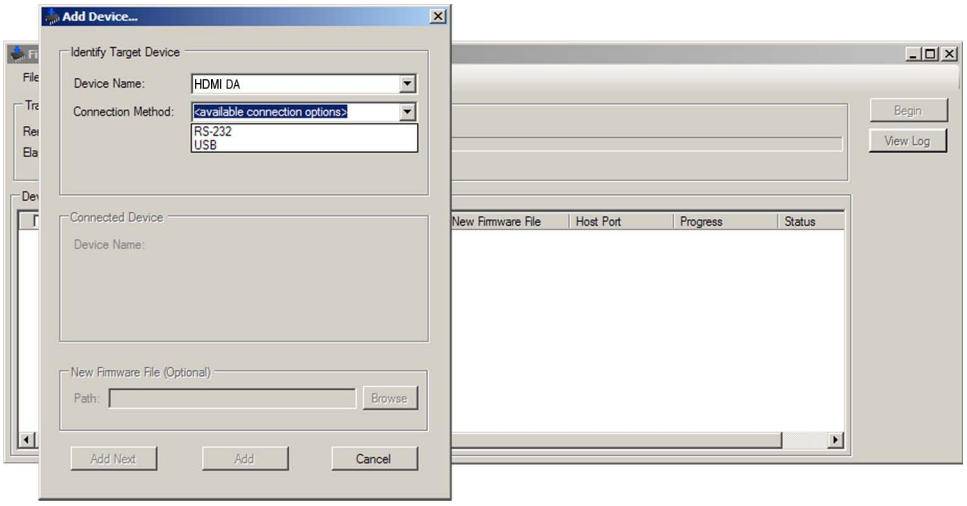


Figure 10. Opening Firmware Loader

4. In the Add Device dialog select the device from the **Device Names** drop-down list (this may be **HDMI DA4**, **HDMI DA6** or **HDMI DA**).
5. From the **Connection Method** drop-down list, select either **RS-232** or **USB**.
6. Depending on the connection method that you selected, additional options appear. Make the appropriate selections for your connection method.
   - **RS-232**: Select the appropriate options from the **Com Port** and **Baud Rate** menus (this information is provided by your system administrator).
   - **USB**: Only the **Extron USB Device_Ø** option is available on the **Available Devices** menu. Make sure that it is selected.
7. Click **Connect**. If the connection is successful, HDMI DA4 or HDMI DA6 is displayed in green in the Connected Device section, followed by a green check mark.
8. Click **Browse** in the New Firmware File (Optional) section.

9. In the Open dialog box, navigate to the new firmware file, which has an S19 extension, and double-click it.

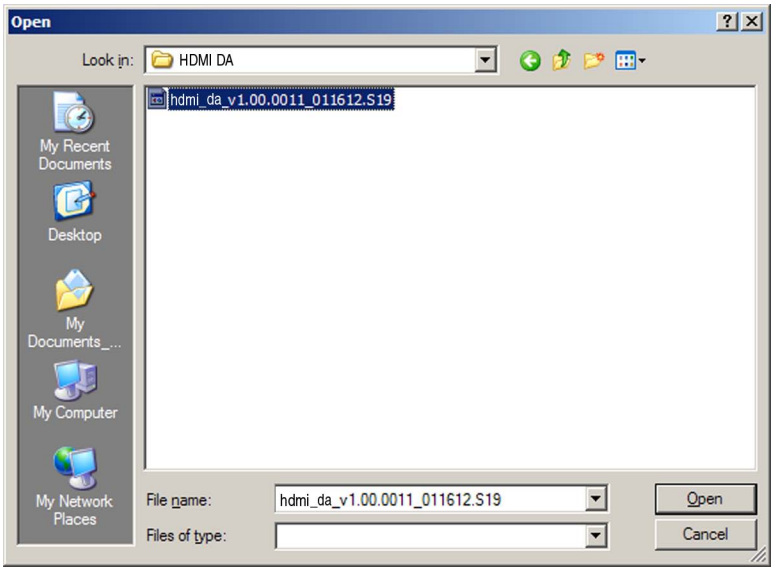


Figure 11. Open Window for Firmware File Selection

ATTENTION: Valid firmware files must have the file extension **S19**. A file with any other extension is not a firmware upgrade for this product and could cause the distribution amplifier to stop functioning.

NOTES:

- The original factory-installed firmware is permanently available on the HDMI DA4 or HDMI DA6. If the attempted firmware upload fails for any reason, the unit reverts to the factory version.
- By default, when the firmware is downloaded from the Extron site, it is saved in one of the following paths:
  `C:\Program Files\Extron\Firmware\`***`folder_name`*** (Windows XP) or
  `C:\Program Files (x86)\Extron\Firmware\`***`folder_name`*** (Windows 7)
  where ***`folder_name`*** may be `HDMI DA4`, `HDMI DA6`, `HDMI DA`, or something similar.

In the Add Device dialog box, the path to the new firmware file is displayed in the **Path** field.

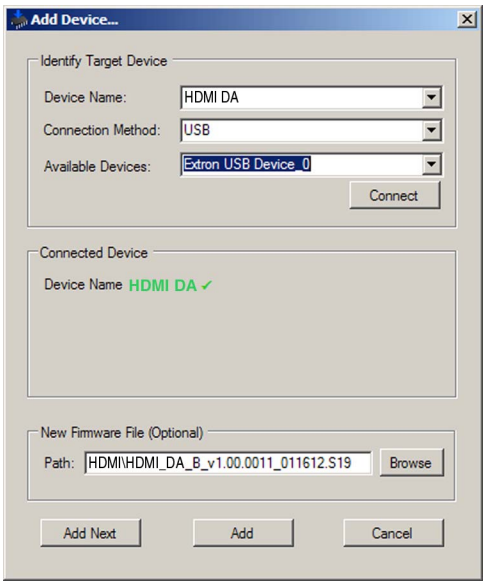


Figure 12. Path to the New Firmware File on the Add Device Window

10. **If this is the only device to which you are uploading firmware,** click **Add**. The distribution amplifier information is added to the Devices section of the Firmware Loader dialog box and the Add Device dialog box closes.

    If you will be uploading the firmware to multiple units that are connected to your computer, do the following:

    a. Click **Add Next**. Your first device is added to the Devices section of Firmware Loader dialog box, and the Add Device dialog box remains open.

    b. For each additional device you want to add to the Firmware Loader dialog box, repeat steps 5 through 9, then click **Add Next**.

    c. For the last device, click **Add** (instead of **Add Next**) to add the device and to close the Add Device dialog box.

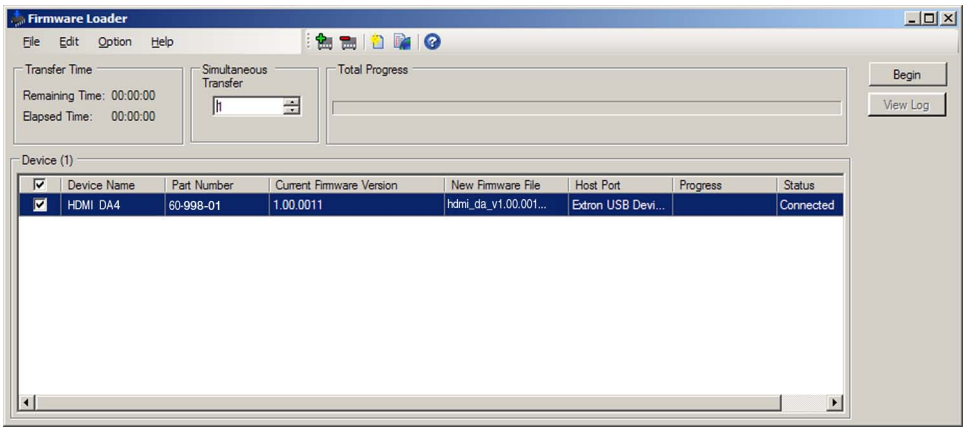


Figure 13. Firmware Loader Screen with a HDMI DA4 Added

11. If you want to remove a device from the Devices section, do the following:
    a. Click on the names of the devices to be deleted, to highlight them.
    b. Select **Edit** > **Remove Selected Device(s)** from the toolbar.
    c. On the Remove Device(s) window, select or deselect any devices on the list as desired, then click **Remove**.

    To remove **all** devices, select **Edit** > **Remove All Devices** from the toolbar.
12. Click **Begin**. The following indicators show the progress of the update:
    - The Transfer Time section shows the amounts of remaining and elapsed time for the update.
    - The Total Progress section displays a progress bar with `Uploading...` above it.
    - In the Devices section, the Progress column displays an incrementing percentage and another progress bar. The Status column displays `Uploading`.
13. The upload is complete when the **Remaining Time** field shows `00.00.00`, the Progress column shows `100%`, and `Completed` is displayed above the progress bar and in the **Status** field. Close the Firmware Loader dialog box.

Extron Warranty

Extron Electronics warrants this product against defects in materials and workmanship for a period of three years from the date of purchase. In the event of malfunction during the warranty period attributable directly to faulty workmanship and/or materials, Extron Electronics will, at its option, repair or replace said products or components, to whatever extent it shall deem necessary to restore said product to proper operating condition, provided that it is returned within the warranty period, with proof of purchase and description of malfunction to:

USA, Canada, South America, and Central America:
Extron Electronics
1230 South Lewis Street
Anaheim, CA 92805
U.S.A.

Japan:
Extron Electronics, Japan
Kyodo Building, 16 Ichibancho
Chiyoda-ku, Tokyo 102-0082
Japan

Europe and Africa:
Extron Europe
Hanzeboulevard 10
3825 PH Amersfoort
The Netherlands

China:
Extron China
686 Ronghua Road
Songjiang District
Shanghai 201611
China

Asia:
Extron Asia
135 Joo Seng Road, #04-01
PM Industrial Bldg.
Singapore 368363
Singapore

Middle East:
Extron Middle East
Dubai Airport Free Zone
F12, PO Box 293666
United Arab Emirates, Dubai

This Limited Warranty does not apply if the fault has been caused by misuse, improper handling care, electrical or mechanical abuse, abnormal operating conditions, or if modifications were made to the product that were not authorized by Extron.

NOTES: If a product is defective, please call Extron and ask for an Application Engineer to receive an RA (Return Authorization) number. This will begin the repair process.

USA:	714.491.1500 or 800.633.9876	**Europe:**	31.33.453.4040
Asia:	65.6383.4400	**Japan:**	81.3.3511.7655

Units must be returned insured, with shipping charges prepaid. If not insured, you assume the risk of loss or damage during shipment. Returned units must include the serial number and a description of the problem, as well as the name of the person to contact in case there are any questions.

Extron Electronics makes no further warranties either expressed or implied with respect to the product and its quality, performance, merchantability, or fitness for any particular use. In no event will Extron Electronics be liable for direct, indirect, or consequential damages resulting from any defect in this product even if Extron Electronics has been advised of such damage.

Please note that laws vary from state to state and country to country, and that some provisions of this warranty may not apply to you.

Extron Headquarters	Extron Europe	Extron Asia	Extron Japan	Extron China	Extron Middle East	Extron Korea	Extron India
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